NASA SBIR/STTR Technologies

A1.03-9714 - High Resolution Autostereoscopic Cockpit Display

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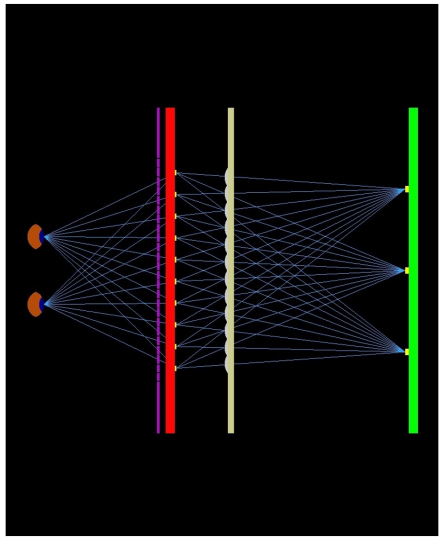
Identification and Significance of Innovation

The utility of stereoscopic 3D image representation in many applications is now well established. It is not just a matter of stereo being better than 2D, but of stereo being necessary to interpret displayed information in many instances. The US Air Force and others including NASA recognize the potential for 3D display in the cockpit but until now the limitations of 3D display technology have prevented implementation.

DTI's display technology creates genuine depth in high definition (HD) without the loss of resolution, loss of brightness, head position restrictions, or visual artifacts present in other glasses-free 3D displays. The technology offered by DTI is different than others due to its use of a dynamic time multiplexed LED backlight unit (BLU) located behind the display, instead of static optics or barriers on the front of the display, to create the 3D effect.



Estimated TRL at beginning and end of contract: (Begin: 4 End: 6)

Technical Objectives and Work Plan

The end goal of the Phase II program is the construction of a prototype 15" autostereoscopic cockpit display for testing in a 787 simulator at the Boeing Flight Deck Concept Center.

The goal of year one will be the configuration and testing of an initial laboratory prototype of the final deliverable. This prototype will be the first sample to possess the properties of the four major sub-systems of the unit: Optical, Hardware, Software and Mechanical which will all be configured and synchronized to be used in the final deliverable. It will afford a chance to troubleshoot unforeseen problems and identify areas for improved design after testing, before the final deliverable is built.

Based on results achieved with the laboratory prototype, and the documented revision and improvement plan, DTI will produce a deliverable prototype designed to operate within the cockpit simulator and assist Boeing in installing and testing the display. Testing will likely extend into Phase III and be followed by testing aboard an aircraft.

NASA Applications

NASA's main interest in this topic was improvements in commercial aircraft safety, particularly transport aircraft safety. However, the technology has potential application within NASA itself, in cockpit displays for NASA aircraft and spacecraft, and for human controlled telerobotic operations on the International Space Station. Scientific visualization is another area of NASA interest.

Non-NASA Applications

DTI has already received interest in this technology from an automobile manufacturer and a point of sale display manufacturer. Other potential areas of application include endoscopic and robotic surgery, patient education, student education, consumer gaming and comsumer television.

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